Historic, archived document

Do not assume content reflects current scientific knowledge, policies, or practices.

UNITED STATES DEPARTMENT OF AGRICULTURE

BULLETIN No. 1070

Washington, D. C. July, 1922

FARM MANAGEMENT IN CATAWBA COUNTY, NORTH CAROLINA.

By J. M. Johnson, *Agriculturist*, and E. D. Strait, *Assistant Farm Economist, Bureau of Agricultural Economics, in cooperation with North Carolina State Board of Agriculture.*

CONTENTS.

	Page.		Page.
Summary of results	1	Type of farming and analysis of farm business	5
General description of area	3	Crop rotations	17

This study is based on a farm business analysis survey of 297 farms, for the year 1912 and of 304 farms for the year 1918 in Catawba County, N. C., and on census reports for that county from 1850 to 1920, inclusive. (Table 1.) The facts brought out, though strictly applicable only to the area surveyed, should offer valuable suggestions to all farmers throughout the lower Piedmont region.

The objects of this study were:

1. To ascertain the type of farming followed and the profits realized in a long-established agricultural community of the southern Piedmont country.
2. To determine the importance of such factors as the size and the quality of the farm business as they affect the economic organization of farms.
3. To bring out the farm practices that enable some farmers to excel others in single enterprises or in the entire farm organization.
4. To note changes that have taken place in the type of farming during the six-year period.
5. To determine the change that has taken place in crop yields, prices received for products, quantities of the several products available for sale, and expenses of operating the farm business, and, so far as practicable, their effect upon the farm profits of the area.

SUMMARY OF RESULTS.

The more important facts brought out by this study may be summarized as follows:

Type of farming.—General crop farming with live stock.

Size of farm.—In 1912 the 297 farms studied averaged 121 acres in size, 57 per cent of the land being tillable. In 1918 the 304 farms studied averaged 111.5 acres in size, 58 per cent of the land being tillable. Most of the untillable land was in woods or in pasture. In 1912 the average value of real estate was $45 per acre and in 1918 it was $66.

Capital invested.—The average capital invested in the farms in 1912 was $6,530, and in 1918 it was $8, 858. About 83 per cent of this represented real estate.

In 1912 a working capital of $1,070 and in 1918 of $1,461 was required to operate the average farm.

Income.—For the year 1912 the average labor income was $86 and for 1918 it was $542.

For the year 1912 the average family income was $546 and for 1918 it was $1,166. This includes money paid on debts, but not the value of food products, fuel, and use of house furnished by the farm, which in 1912 averaged $328 per farm and in 1918, $573. In 1912 for all farms of 30 crop acres or under the average amount of the family income was $260, and in 1918, $611; for the farms of over 70 crop acres the family income in 1912 averaged $1,144 and in 1918 $2,225.

Receipts.—About two-thirds of all receipts were from crops. Cotton, cattle, sweet potatoes, and wheat were the four leading sources of income.

The leading cash crop was cotton, returns from that crop representing about two-fifths of all receipts.

TABLE 1.—*Census data showing changes in the agriculture of Catawba County, N. C., since 1850.*

Item.	1850	1860	1870	1880	1890	1900	1910	1920
Number of farms	....	1,078	698	1,725	2,119	2,647	3,199	2,916
Land in farms, acres	221,653	221,615	127,954	219,673	237,734	239,824	241,037	217,463
Improved land in farms, acres	64,439	67,833	39,203	78,080	101,193	116,379	125,564	113,685
Improved land per farm (acres)	....	62.9	56.3	44.4	47.8	44.0	39.2	39
Value of real estate	$812,535	$1,715,639	$607,424	$1,723,438	$2,814,560	$2,758,590	$7,324,304	$10,885,426
Value of machinery	118,115	85,611	37,387	86,140	124,560	168,680	326,497	734,346
Value of live stock	221,877	386,207	152,563	241,219	322,710	375,660	763,276	1,250,017
Value of real estate, machinery, and live stock	1,152,527	2,187,457	797,374	2,050,797	3,261,830	3,302,930	8,414,077	12,869,789
Milk cows	2,581	2,752	1,458	2,871	3,042	3,379	4,891	4,955
Other cattle	3,582	3,278	2,135	3,835	4,011	3,979	4,218	3,575
Swine	19,891	17,828	6,768	10,594	10,239	8,067	7,187	8,812
Sheep	6,280	6,146	4,644	6,299	3,961	1,584	359	184
Butter produced, lbs.	73,337	82,769	29,679	120,784	246,025	379,515	633,739	523,782
Cheese produced, lbs.	1,141	63	100	1,338	425	191	356	280
Milk produced, gals.	....	....	....	....	1,080,297	1,824,658	1,865,390	1,711,616
Eggs produced, doz.	....	....	....	159,206	187,189	337,680	466,146	467,665
Corn, bushels	355,185	403,213	142,876	358,210	317,544	389,280	448,855	401,433
Wheat, bushels	52,190	91,702	34,746	104,770	163,977	274,740	135,756	160,182
Oats, bushels	65,674	23,799	41,553	64,236	71,875	31,970	87,185	23,478
Rye, bushels	5,263	717	1,917	783	1,204	590	7,394	6,980
Cotton, bales	652	138	18	2,012	2,412	4,018	6,344	7,311
Hay, tons	2,925	1,871	3	1,137	2,504	7,733	7,679	16,417
Sweet potatoes, bush.	21,215	27,661	5,177	19,325	42,447	49,924	195,679	189,938
Irish potatoes, bush.	10,606	9,701	4,540	12,687	22,520	4,531	20,541	17,619
Sorghum sirup, gals.	0	9,747	7,082	28,884	28,340	17,098	21,243	16,178
Tobacco, lbs.	6,086	9,308	25	26,380	16,400	8,600	638	9,930

GENERAL DESCRIPTION OF AREA.

Catawba County, N. C., is near the center of the western or more elevated half of the Piedmont region of the State. Newton, at the center of the area surveyed, is about 150 miles west of Raleigh and about 75 miles east of Asheville. The surface of the region is rolling, the elevation varying from about 700 feet to about 1,100 feet (fig. 1).

A fringe of rich bottom lands, varying in width from only a few rods to a half mile, borders the important streams. When properly drained these lands produce large yields of corn, small grains, and grasses, and where the elevation is sufficient they make good yields of cotton. Between the bottom lands and the uplands are a series of slopes. When erosion is prevented by deep plowing and careful terracing, these slopes produce good yields. The steeper slopes in many places have become so eroded that their cultivation is difficult and unprofitable.

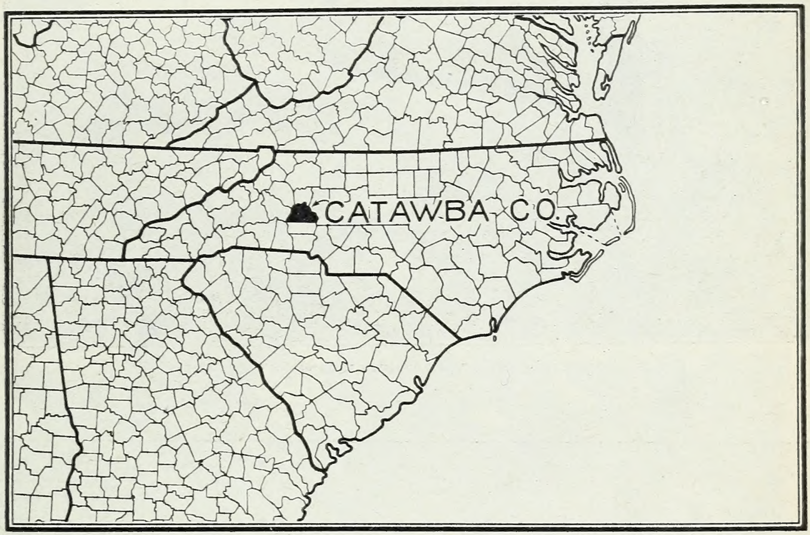

Fig. 1.—Map showing location of area studied.

The uplands, which constitute by far the greater part of the area surveyed, are more or less rolling, free from steep slopes and bluff formations, and show but few outcropping ledges and bowlders. Modern farm machinery can be used to advantage over nearly all these lands. All crops common to the central Piedmont region of the South are grown more or less extensively and successfully. Most of the better class of farm homes are located on these lands (figs. 2, 3, and 4).

The climate, fairly mild and equable, is suitable for the growing of a large variety of farm crops. Extremes of temperature are almost

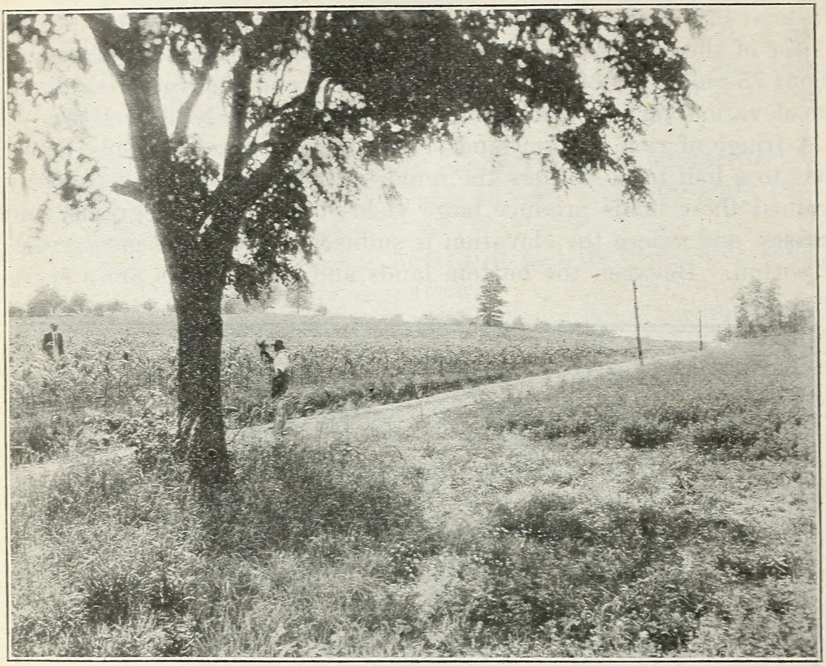

FIG. 2.—Topography of Catawba County uplands of the better class.

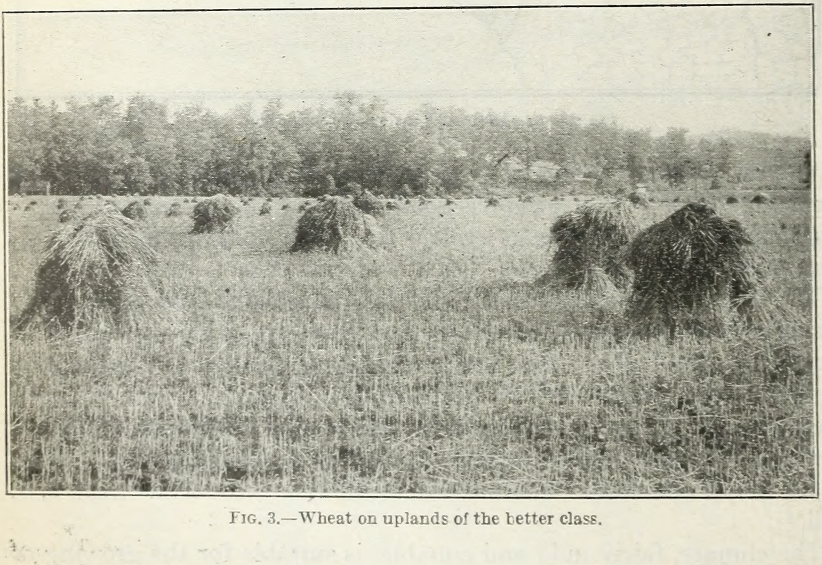

FIG. 3.—Wheat on uplands of the better class.

unknown here. The temperature seldom goes as high as 100° F. or as low as zero.

The elevation, rolling topography, good surface drainage, and abundance of spring and well water, together with the mild and invigorating climate, give this area many advantages as a place of residence.

TYPE OF FARMING AND ANALYSIS OF FARM BUSINESS.

The farmers of this section practice a general or mixed type of crop farming, about two-thirds of all receipts being from crops. In acreage the leading crops are wheat, corn, and cotton. About 38 per cent of the farm receipts in 1918 were from cotton.

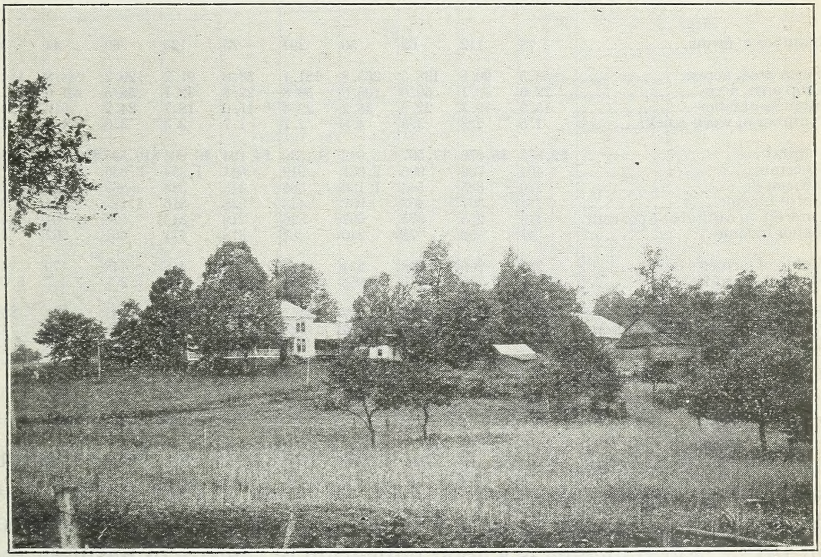

FIG. 4.—Farmstead of the better type.

Measured by the receipts derived from various enterprises, the type of agriculture during the very earliest period was live stock, which changed early in the nineteenth century to grain, with live stock as secondary. This continued up to about 1880. At that time cotton became the dominating factor in the type of farming, which position it still holds.

As much grain is grown now as at any time in the history of the county, but cotton has made large gains, while the other enterprises have very little more than remained stationary.

The meat-producing branches of live-stock farming have been losing in importance for more than 70 years. Catawba County is frequently referred to as a dairy county, though very few farmers receive sufficient income from dairy products to warrant their being classified as dairy farmers. In 1912, 10 per cent of the receipts were from dairy products, and in 1918, 9 per cent.

In Table 2 is given a summary of the farm business of 297 farms for 1912 and 304 farms for 1918. It shows comparisons of the size of farm, crop area, amount of labor, work stock, capital, receipts, expenses, and profits for each sized group for the two years.

TABLE 2.—*Summary of the farm business of 297 farms for 1912 and 304 farms for 1918, Catawba County, N. C.*

Item.	1912					1918				
	30 crop acres or under.	30.1 to 50 crop acres.	50.1 to 70 crop acres.	Over 70 crop acres.	All farms.	30 crop acres or under.	30.1 to 50 crop acres.	50.1 to 70 crop acres.	Over 70 crop acres.	All farms.
Number of farms	73	112	62	50	297	75	125	60	44	304
Farm area, acres	53.5	90.8	138.5	265.8	121.1	53.0	91.2	129.2	244.8	111.5
Crop area, acres	22.6	40.1	60.0	105.0	50.8	22.8	39.1	58.5	101.6	47.9
Months of labor	15.9	19.3	22.8	38.2	22.4	15.0	18.7	24.2	36.0	21.4
Number of work stock	1.5	2.3	3.3	4.8	2.7	1.7	2.3	3.0	4.5	2.6
Capital	$2,855	$5,076	$7,507	$13,942	$6,530	$4,194	$6,906	$10,525	$20,077	$8,858
Receipts	404	702	996	2,067	919	841	1,354	2,056	3,839	1,726
Expenses	220	395	543	1,130	506	313	538	869	1,873	741
Farm income	184	307	453	937	413	528	816	1,187	1,966	985
Interest on capital at 5 per cent	143	255	375	697	326	210	345	526	1,004	443
Labor income	41	52	78	240	87	318	471	661	962	542
Value of farmer's labor	230	269	268	271	260	360	418	448	470	417
Return on capital	−2.0%	0.7%	2.4%	4.8%	1.1%	3.9%	6.2%	7.2%	7.0%	6.0%
Farm income	$184	$307	$453	$937	$413	$528	$816	$1,187	$1,966	$985
Value of unpaid family labor	76	129	148	207	133	83	177	256	259	181
Family income	260	436	601	1,144	546	611	993	1,443	2,225	1,166
Family living supplied directly by farm	244	313	378	428	328	436	551	677	730	573

The farm income, which is the difference between total receipts and total expenses, averaged $413 for all farms in 1912 and $985 for 1918; that is, the farm income was 140 per cent greater in 1918 than in 1912. Farm income is a good indication of the size of business and of the prosperity of the groups of farms studied. It shows the increase that occurred in the earning power of farms as a result of increased prices of farm products. Considering the great drop that has since occurred in prices for agricultural products and the relatively smaller decrease in the prices of supplies the farmer requires, it is probable that the farmer's income for 1920 and 1921 was less than for 1912.

The family income, which is a good measure of the purchasing power of the farmer, was about double in 1918 what it was in 1912. It is likely that 1918 was a year as favorable from the standpoint of income as the farmer may expect in the near future.

The labor income, which represents the amount of money the farmer received for his year's labor after paying all farm expenses, including as expenses the value of labor performed by his family, and allowing 5 per cent interest on the capital invested averaged $87 per farm for 1912 and $542 per farm for 1918.

In addition to this labor income the farmers received house rent and what the farm furnished toward the family living. In 1918 this averaged $573 per farm. These figures were not obtained direct for 1912, but were calculated by applying 1912 prices to the quantities used in 1918. In 1912 this form of income averaged $328 per farm.

DISTRIBUTION OF FARM AREA.

The farm area for the 297 farms surveyed in 1912 averaged 121.1 acres per farm, and for the 304 farms surveyed in 1918 it averaged 111.5 acres per farm, or 9.6 acres less per farm (Table 3).

TABLE 3.—*Distribution of farm area on 297 farms for 1912 and 304 farms for 1918, Catawba County, N. C.*

Item.	1912					1918				
	30 crop acres or under.	30.1 to 50 crop acres.	50.1 to 70 crop acres.	Over 70 crop acres.	All farms.	30 crop acres or under.	30.1 to 50 crop acres.	50.1 to 70 crop acres.	Over 70 crop acres.	All farms.
Number of farms	73	112	62	50	297	75	125	60	44	304
Acres per farm	53.5	90.8	138.5	265.8	121.1	53.0	91.2	129.2	244.8	111.5
Tillable area	30.2	50.5	81.9	153.5	69.4	30.5	53.1	75.3	136.5	64.0
Crop area	22.6	40.1	60.0	105.0	50.8	22.8	39.1	58.5	101.6	47.9
Acres rented out	.3	......	......	.7	.2	.7	.8	.8	2.5	1.1
Tillable pasture	3.2	6.5	11.0	25.0	9.8	3.1	6.9	8.8	21.8	8.5
Idle land	4.1	3.9	10.9	22.8	8.6	3.9	6.3	7.2	10.6	6.5
Untillable pasture	3.1	6.2	9.9	19.6	8.5	4.4	8.6	12.7	21.7	10.3
Woodland, pastured	1.5	3.2	6.5	12.4	5.0	2.9	5.6	9.7	15.4	7.2
Woodland	16.0	26.9	37.5	73.1	34.2	15.0	25.9	36.4	75.4	32.4
Waste	4.2	7.2	9.2	19.6	9.0	3.1	3.6	4.8	11.2	4.8

The crop area per farm averaged 42 per cent of the total farm area in 1912 and 43 per cent in 1918. In 1912, 12.4 per cent of the acreage of tillable land was lying idle or "resting," while in 1918 this area had been reduced to 10.1 per cent. "Resting land" has long been a practice throughout the South. With low-priced land the practice doubtless has been justified, but as values increase the interest on idle land becomes so great as to make the resting of land to restore its fertility no longer profitable.

Table 4 shows the distribution of capital on the farms in 1912 and in 1918. Both years about four-fifths of the capital on the farms was in real estate. In 1912 the value of real estate was $45 per acre and in 1918 $66, or 47 per cent higher. This increase was principally due to the general increase in land values that occurred through this region rather than to improvements on the farm.

TABLE 4.—*Distribution of capital on 297 farms for 1912 and 304 farms for 1918, Catawba County, N. C.*

Item.	1912					1918				
	30 crop acres or under.	30.1 to 50 crop acres.	50.1 to 70 crop acres.	Over 70 crop acres.	All farms.	30 crop acres or under.	30.1 to 50 crop acres.	50.1 to 70 crop acres.	Over 70 crop acres.	All farms.
Number of farms	73	112	62	50	297	75	125	60	44	304
Average capital	$2,855	$5,076	$7,507	$13,942	$6,530	$4,194	$6,906	$10,525	$20,077	$8,858
Land	1,749	3,189	5,096	9,723	4,332	2,477	4,462	6,910	14,579	5,919
Dwellings	504	704	788	1,126	743	697	930	1,174	1,301	975
Other buildings	158	305	414	851	385	250	390	644	1,062	503
Total real estate	2,411	4,198	6,298	11,700	5,460	3,424	5,782	8,728	16,942	7,397
Live stock	254	508	706	1,334	626	383	564	940	1,634	748
Machinery	93	188	278	436	225	170	248	372	594	303
Feed and supplies	77	150	188	407	183	174	258	427	760	344
Cash	20	32	37	65	36	43	54	58	147	66
Total working capital	444	878	1,209	2,242	1,070	770	1,124	1,797	3,135	1,461
Value real estate per acre	45	46	45	44	45	65	63	68	69	66

Table 5 shows the sources of receipts on the farms in 1912 and in 1918, and figure 4 shows the distribution of the principal receipts by crop area groups for 1912 and 1918.

TABLE 5.—*Sources of receipts on 297 farms for 1912 and 304 farms for 1918, Catawba County, N. C.*

Item.	1912					1918				
	30 crop acres or under.	30.1 to 50 crop acres.	50.1 to 70 crop acres.	Over 70 crop acres.	All farms.	30 crop acres or under.	30.1 to 50 crop acres.	50.1 to 70 crop acres.	Over 70 crop acres.	All farms.
Number of farms	73	112	62	50	297	75	125	60	44	304
Receipts, total	$404	$702	$996	$2,067	$919	$841	$1,354	$2,056	$3,839	$1,726
Cotton	141	238	342	767	325	285	532	673	1,269	606
Cotton seed	3	8	8	47	13	27	46	57	150	59
Sweet potatoes	35	64	63	95	62	102	165	249	176	167
Wheat	15	44	67	239	75	28	68	145	535	141
Corn	21	28	50	98	42	40	82	71	302	101
Other crops	47	39	102	125	69	71	96	138	246	120
All crops	262	421	632	1,371	586	553	989	1,333	2,678	1,194
Dairy products	33	80	85	186	87	87	100	189	348	150
Cattle	11	38	45	95	43	20	38	125	386	101
Poultry	29	48	59	50	46	56	65	82	119	74
Hogs	......	15	17	75	21	13	44	62	128	52
All other stock and bees	3	1	1	15	3	0	1	0	......	0
Horses and colts	6	16	19	35	17	1	3	9	......	4
All stock	82	198	226	456	217	177	251	467	981	381
Woodland products	8	19	30	100	32	13	17	59	20	25
Increase feed and supplies	8	17	38	85	31	24	38	81	63	47
Miscellaneous	43	47	70	55	53	74	59	116	97	79

In 1912 the average receipts per farm were $919 and in 1918 $1,726. In 1912, 64 per cent of all the receipts were from crops, 24 per cent from stock, 3 per cent from woodland products, 3 per cent from increase in inventory of feed, and 6 per cent from miscellaneous sources, consisting principally of labor. In 1918, 69 per cent of the receipts were from crops, 22 per cent from stock, 1 per cent from woodland products, 3 per cent from increase in inventory of feed, and 5 per cent from miscellaneous sources.

In 1912, 37 per cent of the farm receipts were from cotton and cotton seed, while in 1918, 39 per cent of the receipts were from this crop (Table 5).

The amount of cotton sold, however, averaged 2,833 pounds per farm in 1912, while in 1918 it was 2,113 pounds (Table 6).

In 1912, 7 per cent and in 1918, 10 per cent of the receipts were from sweet potatoes. On an average 103 bushels were sold per farm in 1912 and 113 bushels in 1918.

DISTRIBUTION OF CROP AREA.

Table 6 shows the distribution of the crop area, yields, amounts sold, and selling prices of farm products on the farms for 1912 and 1918.

TABLE 6.—*Distribution of crop area, yields, amount sold, and selling prices of farm products on 297 farms for 1912 and 304 farms for 1918, Catawba County, N. C.*

Item.	1912					1918				
	30 crop acres or under.	30.1 to 50 crop acres.	50.1 to 70 crop acres.	Over 70 crop acres.	All farms.	30 crop acres or under.	30.1 to 50 crop acres.	50.1 to 70 crop acres.	Over 70 crop acres.	All farms.
Number of farms	73	112	62	50	297	75	125	60	44	304
Crop area, total	22.6	40.1	60.0	105.0	50.8	22.8	39.1	58.5	101.6	47.9
Wheat	5.0	9.4	13.7	25.7	12.0	5.8	10.2	14.9	31.6	13.2
Corn	7.5	11.8	15.8	26.8	14.1	7.4	10.5	14.7	25.2	12.7
Cotton	4.7	7.1	10.8	20.1	9.4	3.6	6.3	8.2	14.4	7.2
Rye	.2	1.1	1.3	2.0	1.1	.3	1.2	1.9	3.1	1.4
Oats	1.0	2.7	4.7	8.1	3.6	.6	1.2	2.5	2.2	1.4
Sweet potatoes	.8	1.0	1.2	1.6	1.1	.8	1.2	1.7	1.2	1.2
Soy bean and cow pea hay	.3	1.0	1.2	3.0	1.2	1.5	2.4	4.5	4.7	2.9
Oat hay	.7	1.6	2.4	4.1	1.9	.6	1.1	1.6	1.8	1.2
Red clover hay	.2	1.1	1.5	2.8	1.2	.1	1.1	1.5	8.0	1.9
Meadow hay	.6	.5	2.6	3.6	1.5	.1	.4	.8	.6	.4
All other crops	1.6	2.8	4.8	7.2	3.7	2.0	3.5	6.2	8.8	4.4
Second or intertilled crops	1.8	4.2	3.9	8.3	4.2	3.6	4.6	8.8	13.2	6 4
Yield per acre of—										
Wheat bu.	10	11	11	13	11	8	8	9	11	9
Corn bu.	22	23	23	25	23	23	24	23	26	24
Cotton lbs.	270	298	277	328	301	266	293	286	310	293
Rye bu.	5	7	7	7	7	5	5	5	6	5
Oats bu.	19	19	17	21	20	15	16	17	20	17
Sweet potatoes bu.	128	166	139	162	152	139	142	141	151	142
Amount sold—										
Wheat bu.	13	40	61	213	67	12	29	60	229	60
Corn bu.	24	35	60	118	51	26	54	47	207	67
Cotton lbs.	1,261	2,108	2,976	6,575	2,833	965	1,853	2,355	4,479	2,113
Cotton seed bu.	12	24	25	142	41	26	45	55	144	57
Sweet potatoes bu.	56	106	100	169	103	69	114	162	117	113
Selling price of—										
Cotton lbs.	$0.112	$0.113	$0.115	$0.117	$0.115	$0.296	$0.287	$0.286	$0.283	$0.287
Cotton seed bu.	.29	.32	.32	.33	.33	1.03	1.03	1.03	1.04	1.03
Sweet potatoes bu.	.62	.61	.63	.56	.60	1.46	1.45	1.54	1.50	1.48
Wheat bu.	1.13	1.10	1.10	1.12	1.11	2.35	2.34	2.39	2.33	2.35
Corn bu.	.89	.81	.83	.83	.83	1.52	1.53	1.51	1.46	1.50

In 1912, 24 per cent of the crop area was in wheat and in 1918, 28 per cent. This increase in area devoted to wheat in 1918 was largely owing to the demand for wheat that existed at that time and because the Government appealed to the patriotism of the farmers in urging them to grow more wheat. The yield of wheat was low. In 1912 it averaged 11 bushels per acre and in 1918 only 9 bushels. One would expect that where the yields of wheat per acre were low wheat would be less profitable than some other crops yielding a greater money return per acre. Table 7 shows the relation between the acreage of wheat, total receipts, and farm and labor income on 297 farms for 1912 and 304 farms for 1918. It will be seen that, in general, income declines as wheat acreage increases. Where less than 10 per cent of the crop acreage goes into wheat a poor yield will not cut down the farm income very much, but where much over 10 per cent of the crop acreage is in wheat it is important to make an effort to increase the yield.

TABLE 7.—*Relation between per cent of total crop land in wheat and total receipts, farm income, and labor income on 297 farms for 1912 and 304 farms for 1918, Catawba County, N. C.*

Item.	Per cent of crop acres in wheat.											
	1912.						1918.					
	10 per cent and less.	10.1 to 20 per cent.	20.1 to 30 per cent.	30.1 to 40 per cent.	Over 40 per cent.	All farms.	10 per cent and less.	10.1 to 20 per cent.	20.1 to 30 per cent.	30.1 to 40 per cent.	Over 40 per cent.	All farms.
Number of farms	30	82	117	51	17	297	12	75	119	68	30	304
Crop area, acres	45.2	51.5	48.8	55.4	52.4	50.8	30.1	45.6	46.6	49.0	63.7	47.9
Acres in wheat	1.7	8.4	12.1	19.1	24.4	12.0	1.2	7.5	11.6	16.8	30.0	13.2
Total receipts	$1,446	$967	$858	$917	$885	$919	$1,302	$1,854	$1,766	$1,658	$1,873	$1,726
Receipts from wheat.	7	42	64	142	219	75	4	50	103	184	468	141
Farm income	583	440	356	407	402	413	784	1,059	1,033	859	969	985
Labor income	196	134	61	44	−29	86	482	635	601	431	346	542

To show the effect of increased yields of wheat on income, all farms that had over 30 per cent of their crop acreage in wheat were grouped into two groups; the first group consisted of all farms on which the yield of wheat was below the average, the second group of those with yield above the average. In 1912 the average acreage of wheat per farm for these groups was 20.4 acres. There were 39 of these farms with an average yield of 8.6 bushels per acre. Their farm income was $260 and labor income was a minus $69. There were 29 farms with an average yield of 14.6 bushels per acre which had an average farm income of $601 and an average labor income of $153.

In 1918 the average acreage of wheat per farm for these groups was 20.8 acres. The 62 farmers having over 30 per cent of their crop acreage in wheat, but with yields averaging 6.5 bushels per acre, had average farm incomes of $710 and labor incomes of $301, while the 36 farmers who had a yield of wheat averaging 11.9 bushels per acre had an average farm income of $1,207 and an average labor income of $585.

In spite of the fact that the low yield, the topography, and the type of farming followed make the cost of raising wheat high and its production therefore relatively less profitable than that of some other crops, farmers grow wheat here because they do not like to buy flour for bread and do not think it is a mark of good farming to do so. Moreover, the presence of local flour mills makes it easy to have their wheat ground. A small acreage of wheat does not materially interfere with other crops. It fits well into the rotation and is a good nurse crop for clover. Wheat sells at a higher price here than in the wheat belt, and a little wheat to sell in the summer brings in ready cash when it is needed most. The wheat crop is thus the medium through which important steps in raising the cotton crop are financed.

The corn crop occupied 28 per cent of the crop area in 1912 and 26 per cent of the area in 1918. The average yield per acre was 23 bushels in 1912 and 24 bushels in 1918. In both years in which the study was made there was only one farm that did not grow corn. The acreage of corn which the farmer should grow is a question that arises annually. Table 8, showing the relation between the acreage of corn and the farm and labor income on 297 farms for 1912 and 304 farms for 1918, may help to solve the question.

TABLE 8.—*Relation between per cent of total crop land in corn, and total receipts, farm income, and labor income on 297 farms for 1912 and 304 farms for 1918, Catawba County, N. C.*

Item.	Per cent of crop area in corn.											
	1912.						1918.					
	10 per cent and less.	10.1 to 20 per cent.	20.1 to 30 per cent.	30.1 to 40 per cent.	Over 40 per cent.	All farms.	10 per cent and less.	10.1 to 20 per cent.	20.1 to 30 per cent.	30.1 to 40 per cent.	Over 40 per cent.	All farms.
Number of farms	5	56	111	86	39	297	5	61	123	84	31	304
Crop area	40.1	61.3	53.7	47.1	37.4	50.8	33.0	59.9	49.2	42.4	36.8	47.9
Acres in corn	4.6	9.8	13.3	16.2	18.0	14.1	2.8	9.3	12.3	14.5	17.4	12.7
Total receipts	$687	$1,333	$937	$860	$740	$919	$1,441	$2,332	$1,733	$1,615	$1,146	$1,726
Receipts from corn	16	13	40	52	72	42	4	58	80	134	195	101
Farm income	306	573	394	379	328	413	906	1,292	972	902	665	985
Labor income	62	134	56	123	278	87	375	726	545	492	326	542

Disregarding the first groups of farms, both in 1912 and in 1918, since there are only five farms in each, too small a number to make the conclusions very reliable, it will be seen that for both years the farmers making the highest farm incomes were those growing the smallest acreages of corn.

To show the effect of increased yields of corn per acre on farm profits, only farmers with over 30 per cent of their crop acreage in corn were selected. Of course other factors besides the yield of corn influenced the profits on these farms, but where so great a proportion of the crop acreage was in corn the yield of that crop was bound to have considerable weight.

In 1912 farmers who got a yield of only 16 bushels of corn per acre made an average labor income of $48, while those with a yield of 30 bushels per acre got an average labor income of $175. It will be remembered that the average labor income of all farms in 1912 was $87. In 1918 the farmers who got less than an average yield of corn got an average labor income of $337, while those with an average yield of 31 bushels of corn per acre got an average labor income of $633. In 1918 the average labor income of all farms was $542.

FIG. 5.—Catawba County cotton field. Cotton is the main money crop of this area.

Among factors favorable to the growing of corn may be cited the fact that it is an excellent feed for farm stock; that any surplus has a ready market at good prices in this region; and that on lowlands very large yields per acre are possible. Among the unfavorable factors are the fact that it competes with cotton and sweet potatoes for labor; that the yield is generally low, in 1912 averaging 23 bushels per acre, and in 1918 24 bushels; and that weevils often causes considerable damage.

The cotton crop occupied 19 per cent of the crop area in 1912 and 15 per cent of the area in 1918. The average yield per acre was 0.6 bale (301 pounds) in 1912 and 0.59 bale (293 pounds) in 1918. In 1912 and 1918, 18 farmers raised no cotton. With the exception of sweet potatoes, cotton returns higher receipts per acre than any other crop that is extensively grown in this area. As has been pointed out in the preceding pages, from the standpoint of receipts, cotton is the leading enterprise. Table 1 (page 2) shows the increasing importance of the cotton crop in this county since 1850 (see fig. 5).

In 1912, with cotton selling at 11.5 cents per pound, the study indicated that from 20 to 40 per cent of the crop land planted to cotton gave the highest farm and labor income. That year 37 per cent of all the farms came in that group. In 1918, with cotton selling at 28.7 cents per pound, the farmers who had 10 to 30 per cent of their crop land in cotton got the highest incomes. That year 63 per cent of all the farms came in that group.

Table 9 shows very strikingly the effect of high yields on income. For example, in 1912 the farms had an average of 22.1 acres of cotton per farm, but with a yield below the average made an average labor income of $74, while the small farms that had an average of 9.1 acres per farm, but with a yield above the average, made an average labor income of $189 per farm. The farmers who had the largest acreage in cotton and the highest yields per acre made an average labor income of $683.

TABLE 9.—*Effect of increased yields of cotton per acre on farm income and labor income on 120 farms for 1912 and 84 farms for 1918 with over 20 per cent of their crop acreage in cotton, Catawba County, N. C.*

Item.	1912				1918			
	Yield of 301 pounds or less per acre.		Yield of over 301 pounds per acre.		Yield of 293 pounds or less per acre.		Yield of over 293 pounds per acre.	
	50.8 crop acres or less.	Over 50.8 crop acres.	50.8 crop acres or less.	Over 50.8 crop acres.	47.9 crop acres or less.	Over 47.9 crop acres.	47.9 crop acres or less.	Over 47.9 crop acres.
Number of farms	52	26	28	14	39	11	22	12
Average acres in cotton	9.7	22.1	9.1	27.9	9.1	20.2	7.9	19.4
Average yield per acre ...... pounds	238	242	369	396	232	225	374	361
Farm income	$214	$451	$388	$1,423	$727	$1,266	$1,106	$2,076
Labor income	28	74	189	683	466	647	744	1,488

In 1918 the farms that had an average of 20.2 acres of cotton per farm, but with a yield below the average, made an average labor income of $647, while the small farms that had only 7.9 acres of cotton per farm, but with a yield above the average, made a labor income of $744. The 12 farmers averaging 19.4 acres of cotton per farm, but with a yield above the average, made an average labor income of $1,488, which is over twice as large as the average of the group of farms with 20.2 acres of cotton per farm but with a yield below the average. Table 9 shows that the maximum profits, both in 1912 and in 1918, were made by the farmer who had an acreage of cotton above the average and yielding above the average.

The sweet potato crop occupied 2 per cent of the crop area in 1912 and 2.5 per cent of the crop area in 1918. As shown in Table 5, 7 per cent of the receipts were from sweet potatoes in 1912 and 10 per cent in 1918. The amount sold per farm averaged 103 bushels in 1912 and 113 bushels in 1918. In 1912 the average price received per bushel was 60 cents and in 1918 it was $1.48.

More farmers raised sweet potatoes in 1918 than in 1912. In 1912 31 per cent of the farmers did not raise sweet potatoes, while only 22 per cent did not raise them in 1918. The number of farmers depending upon sweet potatoes as a source of cash receipts is increasing. In 1912 169 farmers, or 57 per cent of the total, reported sales of sweet potatoes, and in 1918 195 farmers out of 304, or 64 per cent, reported receipts from sweet potatoes.

TABLE 10.—*Relation between yield per acre of sweet potatoes and farm income and labor income on farms having over 5 per cent of their crop acreage in sweet potatoes—47 farms for 1912 and 59 farms for 1918, Catawba County, N. C.*

Item.	1912		1918	
	152 bushels or less per acre.	Over 152 bushels per acre.	142 bushels or less per acre.	Over 142 bushels per acre.
Number of farms	31	16	25	34
Average acreage in sweet potatoes	3.6	3.4	3.4	3.2
Average yield bushels	113	204	108	177
Farm income	$327	$488	$829	$1,166
Labor income	48	162	467	801

In 1912 the farmers who secured an average yield of 113 bushels per acre made an average labor income of $48, while those who averaged 204 bushels per acre made a labor income of $162 (Table 10).

In 1918 farmers who secured an average yield of 108 bushels per acre made labor incomes of $467, while those who averaged 177 bushels per acre made an average labor income of $801 per farm. Of course, not all this difference in income can be directly attributed to difference in yield of sweet potatoes, but certainly some of it can.

Some important factors that are favorable for raising sweet potatoes in this region are a climate and soil well adapted to the crop so that good yields are the rule, successful cooperative marketing associations, and a community of farmers who are experienced in raising the crop. The unfavorable factors are those common to nearly all sweet potato growing areas, namely, plant diseases, difficulty in keeping the crop, and distance from producer to consumer. Then there is the objection that to a certain extent it competes for labor with another high money value crop—cotton.[1]

From the standpoint of acreage in 1912 and again in 1918, hay was the crop fourth in importance. Very little hay is sold, but most farmers grow all the hay needed for their live stock. In 1912 the value of hay bought per farm was $3 and in 1918 it was $5.

Hay fits in fairly well in the rotation, does not compete very seriously for labor with other crops, is useful as a catch crop, and, if a legume, improves the soil.

The climate and soil are favorable for raising a wide variety of truck crops, but the local demand for these products is very limited and competition with other regions is keen, hence comparatively little truck is grown.

Some fruit is grown on every farm for home use, but very little is sold.

Table 11 shows the distribution of live stock and selling prices of some stock products on the farms studied in 1912 and 1918. There was a slight decrease in the number of productive animal units [2] per farm from 1912 to 1918. In 1912 there were six productive animal units per farm, and 5.6 in 1918. Table 5 showed that in 1912 24 per cent and in 1918 22 per cent of all the farm receipts were from live stock.

TABLE 11.—*Distribution of live stock and selling prices of some products on 297 farms for 1912 and 304 farms for 1918, Catawba County, N. C.*

Item.	1912					1918				
	30 crop acres or less.	30.1 to 50 crop acres.	50.1 to 70 crop acres.	Over 70 crop acres.	All farms.	30 crop acres or less.	30.1 to 50 crop acres.	50.1 to 70 crop acres.	Over 70 crop acres.	All farms.
Productive animal units	2.8	5.3	6.9	10.9	6	3.0	4.4	6.7	11.8	5.6
Number of cows	1.6	2.6	3.5	4.7	2.9	1.8	2.4	3.5	6.1	3.0
Number of brood sows	.3	.6	.9	1.2	.7	.3	.6	1.0	1.4	.7
Number of chickens	37	49	65	69	53	39	42	53	65	47
Number of work stock	1.5	2.3	3.3	4.8	2.7	1.7	2.3	3.0	4.5	2.6
Selling prices:										
Butter, pound	$0.20	$0.20	$0.22	$0.26	$0.22	$0.28	$0.39	$0.37	$0.37	$0.36
Hogs, pound dressed	......	......	......	......	.0925	......	......	......	......	.22
Eggs, dozen	.18	.18	.18	.18	.18	.35	.35	.35	.35	.35

Dairy cattle were the principal productive animals kept on these farms. In 1912 cows averaged 2.9 per farm, and 3 in 1918. Jerseys, grade or purebred, or crosses containing Jersey blood, were the most numerous. In 1912 the average dairy cow was valued at $47.81, and in 1918 at $79.05.

---

[1] Where the control methods worked out by the U. S. Department of Agriculture are used the effect of diseases on the sweet-potato crop may be discounted. Moreover, the difficulties formerly experienced in keeping this crop are rapidly being overcome by the development of proper storage methods.

For details as to growing sweet potatoes, see Farmers' Bulletin 999, "Sweet-Potato Growing."

[2] A productive animal unit is a grown steer, cow, or horse or its equivalent in small animals—5 hogs, 7 sheep, or 100 fowls.

In 1912 and in 1918 about 9 per cent of all the farm receipts were derived from the sale of dairy products. It is considered locally that Catawba County is a fairly well developed dairy section, but many of the farmers keep only one or two cows, principally for home use, selling a small amount of butter or cream during the season of highest production. In 1912, eighty-eight per cent and in 1918, eighty-three per cent of the farmers sold some dairy products.

Recently considerable interest has been taken in the further development of the dairy enterprise throughout much of the Piedmont country. At the time the survey was made there was one creamery in the area and several more were within a few miles of the surveyed area. Cream routes have been established over the greater part of the territory.

Several bull associations have recently been organized, and a number of high-class purebred dairy bulls have been brought into the area by others. Most of the dairy cows here are of poor quality, however, and altogether too many farmers fail to give enough attention to using good sires and to weeding out the poor cows from their herds.

In 1912, 5 per cent, and in 1918, 4 per cent of all the farm receipts came from poultry. In 1912, the average number of chickens per farm was 53; in 1918 the number had decreased to 47. All of the farmers kept some poultry, but in spite of the efforts that have been made to encourage the keeping of poultry in the area, there were no large flocks on any of the farms.

In 1912 the receipts from hogs averaged $21 per farm; in 1918, $52 per farm (Table 5). The average number of brood sows per farm each year was 0.7; that is, on every 10 farms studied there were 7 brood sows. The number of swine on farms in Catawba and nearby counties of the Piedmont region has decreased continuously since 1880. The wisdom of this change in practice has frequently been questioned; nevertheless it continues and apparently is becoming more marked decade by decade. Only about one-half of the farmers sold hogs or pork. It is questionable whether under existing conditions much extension of hog raising could be recommended. On many farms, however, more hogs could be kept to consume feed that otherwise would be wasted.

Table 12 shows the distribution of expenses on the farms for 1912 and for 1918.

Table 12.—*Distribution of expenses on 297 farms for 1912 and 304 farms for 1918, Catawba County, N. C.*

Item.	1912					1918				
	30 crop acres or less.	30.1 to 50 crop acres.	50.1 to 70 crop acres.	Over 70 crop acres.	All farms.	30 crop acres or less.	30.1 to 50 crop acres.	50.1 to 70 crop acres.	Over 70 crop acres.	All farms.
Total expense per farm	$220	$395	$543	$1,130	$506	$313	$538	$869	$1,873	$741
Expense for—										
Cropper labor	7	8	29	95	27	16	48	100	530	120
Hired labor and board	13	40	81	298	85	8	20	76	273	64
Unpaid family labor	76	129	148	207	133	83	177	256	259	181
Repairs—										
Machinery	5	9	10	20	10	7	12	20	37	16
House	6	8	11	15	10	8	11	16	18	12
Other buildings	3	6	7	17	7	5	7	10	16	8
Fences	2	5	6	10	5	1	2	3	5	3
Feed bought—										
Hay, etc	3	1	2	5	3	3	3	9	6	5
Grain, etc	13	30	30	79	34	29	26	55	135	48
Fertilizer	29	47	71	130	61	44	70	99	218	91
Ginning	6	10	13	29	13	9	19	24	41	21
Other machine work	1	3	3	5	3	4	5	7	18	6
Insurance	1	2	3	3	2	1	2	2	3	2
Taxes	11	18	25	49	23	17	26	34	58	30
Other items	10	21	29	46	24	26	40	61	110	52
Total current expense	186	337	468	1,008	440	261	468	772	1,727	659
Depreciation:										
Machinery	12	24	35	59	29	18	28	37	65	33
House	14	19	21	26	20	20	23	27	26	24
Other buildings	8	13	18	37	17	11	18	29	44	22
Total	34	56	74	122	66	49	69	93	135	79

In 1912 the total expense per farm averaged $506; in 1918, $741, an increase of 46 per cent. The largest single item of cash expense in 1912 was that of hired labor, amounting to $112 per farm. In 1918 this item amounted to $184 per farm. The value of unpaid family labor was estimated by the farmer in 1912 at $133 and in 1918 at $181. The next largest item of expense was for fertilizer. In 1912 this bill amounted to $61 per farm; in 1918, $91. The cost of repairs on machinery, buildings, and fences averaged $32 per farm in 1912 and $39 per farm in 1918. Depreciation on machinery and buildings, though not a cash expense, nevertheless represents a charge that ultimately must be met, and this averaged $66 per farm in 1912 and $79 per farm in 1918.

CROP ROTATIONS.

The pioneer farmer of this area, and his successors for two or three generations, had no systematically planned crop rotation. Soil fertility problems were not recognized, and for other reasons rotation of crops was not desired. Even at present, crop rotation is not generally practiced on these farms. Practically all rotations yet suggested for the region have serious defects of adaptation to commercial agriculture.

Certain natural conditions have directed the agriculture on some of these lands into a long rotation. The red lands and also the gray, when first brought under cultivation, produced good crops of corn and small grain. In a few years the corn yield dropped off, so that the crop was no longer profitable. Wheat held up to or above the line of profitable yield for some time longer. It then went below this line, but the losses were not very heavy for some time, and wheat continued to be sown, even though not a profitable crop. After a few years more, however, the losses became so great on exhausted lands that wheat was no longer sown. These lands never have been well suited to grazing, and rather than risk time and effort in converting them into hay or pasture they were turned out to grow up, first to broom sedge, then bushes, and finally to "old field," or second-growth pines (fig. 6). While a few acres of the poorer land on the farm may thus be abandoned each year, an approximately equal area of new land is cleared up and used, first for corn, then for small grain, till in the course of time it also is turned out to grow up. Thus on many of the lands of only moderate natural fertility, a long rotation has been established, perhaps unconsciously.

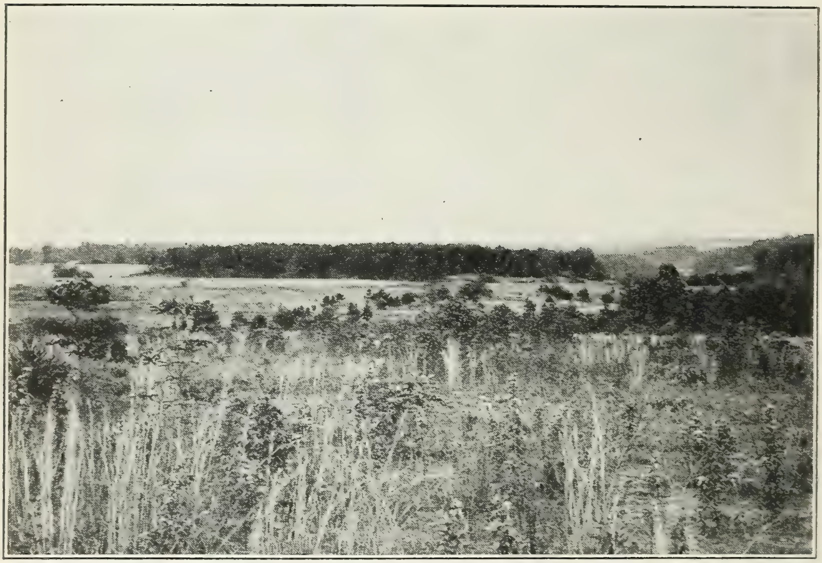

FIG. 6.—Early stage of "resting" land. Broom sedge and briars in foreground, old field pine in distance.

The time required to complete one cycle in the rotation established by the farmer and nature working together is variable. It may be 20 years or it may be 50. Usually, though, it is a little more than the lifetime of a generation of farmers. The grandson clears up and farms these old fields abandoned late in the lifetime of the grandsire.

The visible but unrecorded cropping history of the region is full of examples of these long rotations. How successfully they have fulfilled their mission is shown by the fact that these old fields, when recleared and planted, yield almost if not fully as well as when put under cultivation the first time.

On the better grade of lands conditions have been such as to foster a shorter rotation. The strong lands first cleared of the original forest growth continued to give profitable crops for a considerable period, perhaps a dozen years or more. From 2 to 5 years of rest then suffices to bring them back into a profitable state of fertility. The second cropping period was generally of shorter duration than the first while the time for recuperation was fully as long. Thus in the course of time lands come to be cultivated from 3 to 5 years and then lay out (rested) from 1 to 2 years, while occasionally they were cropped 2 years and rested 1.

The shorter rotation consisted very generally of nonleguminous plants to be disposed of commercially, and broom sedge, weeds, and brush during the soil-resting period. The completion of a cycle in the rotation required from 3 to 7 years, according to the degree of exhaustion of the soil.

Neither of these natural rotations has entirely gone out of use. "Land resting" is still practiced on a considerable percentage of the farms, but the practice is not so universal as it was a few decades ago. In 1912 12.4 per cent and in 1918 10.1 per cent of the tillable land in farms was classified as idle or resting.

The turning out of land to grow up in second-growth or old-field pines is becoming less common with each succeeding generation, and bids fair to cease entirely, in the course of a few decades, or to be confined to lands which really should never have been put under cultivation.

SUGGESTED CROP ROTATIONS.

According to the findings of this survey, rotations used in the Piedmont regions should give prominence to the cotton crop, unquestionably the most important and profitable farm enterprise for the area. The rotations should be such as to utilize to a very full extent the entire crop land of the farms. In general practice the rotation calling for some double cropping should be preferred over others. The rotation should be so planned as to prevent the necessity of resting land, and with a view to utilizing labor, teams, and equipment to the fullest possible degree. Due regard must be given to increasing soil fertility. To this end summer legumes and winter cover crops, both leguminous and nonleguminous, should be grown. In order to utilize teams and labor to the best advantage, considerable land should be available for the late fall, winter, and early spring plowing. This is important. Attention should be given to the crops necessary for feeding live stock and also for furnishing home supplies. The difficulty of adapting different crops and enterprises to different soil types is a factor in determining rotations. On the farm with only one or two types of soil, all of it upland and suitable to a considerable variety of crops, a rotation is easy to plan. When the farm has only lowlands, certain crops must be eliminated and the importance of others magnified in the rotation. On farms with both upland and lowland, one rotation may be required for one part and an entirely different one for the other.

With these points in mind the rotations here suggested have been arranged. As they are studied the importance given to certain enterprises becomes apparent. The fact that one or two rather important enterprises (sweet potatoes, for instance) are not mentioned will be noted. On a great majority of places such crops will be grown only on limited acreages. Their period of growth and cultural requirements are such that they may readily be substituted for some other crops. For example, cotton will be planted in April or May. Sweet potato land should be prepared at the same time or shortly thereafter. The plants should be set in the fields in May or June. If importance in the farming system is to be given to sweet potatoes, a few acres of the land intended for cotton in the rotation can be set aside for the potatoes.

In considering the individual rotations it should be borne in mind that the findings of the survey are that those farms having a comparatively large percentage of their crop land in cotton have better incomes than those upon which this crop occupies but a small percentage of the land, and that when corn yields are above 30 bushels to the acre the farms having over 20 per cent of their crop land planted to this crop have better incomes than the others. The farms having from 10 to 15 per cent of their land in wheat and from 5 to 10 per cent in oats, especially when the yields are somewhat above the average, have a maximum labor income. The farms getting a hay harvest from 20 to 30 per cent or even more of their lands are among the more prosperous. A moderate acreage of sweet potatoes seems to increase farm profits.

The first rotation suggested covers 5 years, gives 40 per cent of the land to cotton, 20 per cent to corn, 20 per cent to small grain (wheat and oats combined), and from 30 to 40 per cent to hay crops, counting double cropping. It keeps practically 60 per cent of the land covered during the winter and makes 40 per cent available for fall and winter plowing. (Rotation 1.)

ROTATION 1.—*Five-year crop rotation for Catawba County, N. C., and other southern Piedmont areas.*

First year. COTTON. After first year's cotton is picked the land may be plowed in winter for second-year cotton crop.
Second year.—COTTON. Planted to rye or crimson-clover cover crop, to be plowed under in spring for third-year corn crop.
Third year.—CORN. Peas or soy beans planted in corn; seed picked, vines disked in, small grain sown in October or November; seeded to red clover in February or March.
Fourth year. SMALL GRAIN. If clover catches, make one cutting of clover hay; otherwise pea or soy bean hay, and then seed to crimson clover.
Fifth year. HAY. One cutting of red-clover hay, or save crimson-clover seed, disk or plow stubble, and plant peas and soy beans for hay. In fall and winter plow for sixth-year cotton.

The five-year rotation may be shortened one year by omitting one hay crop, in which case the farm should be arranged in four fields, two of these planted to cotton, one to corn, and one to small grains, the corn, of course, being followed by cowpeas or soy beans, and the small grain by the same legumes sown broadcast and harvested for hay. This gives 50 per cent of the land to cotton, 25 to corn, 25 to small grain, with a summer crop of hay of 25 per cent. A second method of shortening the five into a four-year rotation is to drop one year of cotton; this brings the cotton acreage down to 25 per cent, leaves 25 per cent in corn, 25 per cent in small grain with clover as a possible fall hay crop, and 25 per cent in clover hay for the June cutting. This rotation will not produce as large a gross income as will the five-year rotation with 40 per cent cotton or the four-year with 50 per cent cotton. However, the expense will not be quite so great and the ultimate net result may possibly be a little greater. It is not difficult to make either of the transitions suggested. (Rotation 2.)

ROTATION 2.—*Four-year crop rotation for Catawba County, N. C., and other southern Piedmont areas.*

First year. COTTON. Planted in April or May; picked from September to December; land available to plow from late fall to middle of spring.
Second year. COTTON. Planted in April or May; first picking in September; plant cover crop; land available for spring plowing.
Third year. CORN. Planted in April or May; at last workiug, plant cowpeas in middles for seed and humus crop; small grain planted in fall.
Fourth year. SMALL GRAIN. Harvested in June; cowpeas or other summer legumes for hay or seed; land available to plow from late fall to spring.

The three-year rotation has been recommended throughout the Piedmont region more extensively than any other and is perhaps the basis of rotations wherever we find them now followed. (Rotation 3.)

ROTATION 3.—*Three-year crop rotation, Catawba County, N. C., and other southern Piedmont areas.*

First year. COTTON. Planted in April and May; first picking in September; cover crop crimson clover or rye planted; land available to plow in spring.

Second year. CORN. Planted in April or May; peas planted in middles at last working of corn; seed picked; land disked and small grain planted.

Third year. SMALL GRAIN. Peas or soy beans planted for hay or seed; land available for fall and winter and early spring plowing.

This arrangement allows approximately one-third for cotton, one-third for small grain, and one-third for corn. If more than the usual amount of stock is being kept this may perhaps be a more desirable rotation than those already described.

For some special cases a two-year rotation, with 50 per cent of the land in cotton, may be desirable. This rotation in addition to giving 50 per cent of the land to cotton gives 25 per cent to small grain, 25 per cent to summer hay crops, and 25 per cent to corn with summer legumes between the corn rows, and with the aid of the manure made on the place will keep the humus content of the soil up to a fairly good standard. This rotation is not recommended for land of a low degree of fertility, nor for farms requiring a great deal of corn and hay for live stock.

ROTATION 4.—*Two-year upland crop rotation for Catawba County, N. C., and other southern Piedmont areas.*

First year. COTTON. Planted in April and May; first picking in September; one-half field planted in small grain; one-half plowed in winter and spring for corn.

Second year. SMALL GRAIN AND CORN. From half of field small grain harvested in June; cowpeas or soy beans for hay or seed; other half of field corn planted in April or May; peas planted in middles at last working; hay harvested in September; corn and peas gathered in October and November; land available for winter and spring plowing.

Occasionally different rotations are wanted for different classes of land on the farm. The farm having both uplands and bottom lands should have a rotation in which cotton is by far the most important crop for the higher lands and one in which preeminence is given to corn for the bottom lands.

For the upland fields, or cotton land, the suggested rotation covers a period of 3 years. (Rotation 5.)

ROTATION 5.—*Three-year upland crop rotation for Catawba County, N. C., and other southern Piedmont areas.*

First year. COTTON. Planted in April and May; first picking in September; cover crop crimson clover or rye; land available for spring plowing.

Second year. COTTON. Planted in April and May; first picking in September; small grain planted after second picking—October.

Third year. SMALL GRAIN. Harvested in June; cowpeas or soy beans for hay, or seed; land available for fall, winter, and spring plowing.

On other lands corn should receive a prominent place. For this purpose a two-year rotation is suggested. (Rotation 6.) When the land is somewhat evenly divided between the upland and lowland the three-year cotton rotation and the two-year corn rotation together make a very desirable system. Of course these rotations may be varied to suit different conditions.

ROTATION 6.—*Two-year lowland rotation for Catawba County, N. C., and other southern Piedmont areas.*

First year. CORN. Plow in April or later and plant corn from April to June; harvest in September or October; disk land and drill oats or other winter and spring crops.

Second year. OATS. Harvest in May or June; plow or disk and plant cowpeas or soy beans for hay and seed; cover crop from September to April.

ADDITIONAL COPIES
OF THIS PUBLICATION MAY BE PROCURED FROM
THE SUPERINTENDENT OF DOCUMENTS
GOVERNMENT PRINTING OFFICE
WASHINGTON, D. C.
AT
5 CENTS PER COPY
▽

WASHINGTON : GOVERNMENT PRINTING OFFICE : 1922